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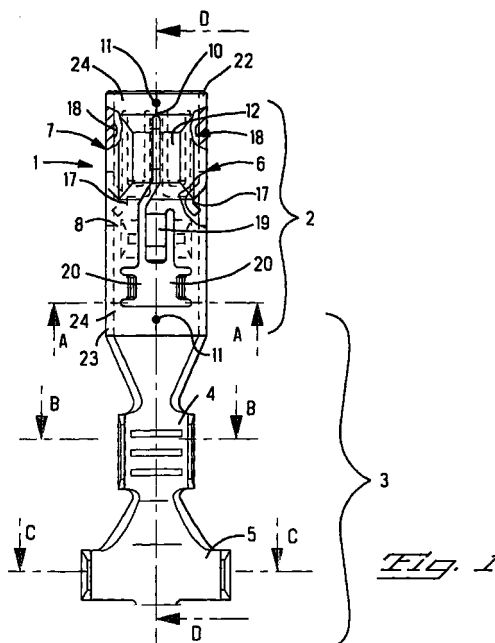
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(54) **Electrical receptacle contact**

(57) An electrical receptacle contact (1) is provided, consisting of a contacting region (2) for contacting a complementary contact blade and a connecting region (3) for connection to an electrical conductor, the contacting region (2) being of box-shaped design with a top wall (8) and a bottom wall (9), and further the contacting region (2) comprises two parallel first contact tongues (13) formed in the bottom wall (9), the top wall (9) comprising at least one first stamping (12) which is oriented into the box-shaped contact region (2) and is intended for contacting the contact blade and which lies opposite the first contact spring tongues (13), and further a web (15) is provided in the bottom wall (9) between the first contact spring tongues (13), running parallel to the first contact spring tongues (13), the web (15) comprising a second stamping (16) which is oriented into the box-shaped contacting region (2) and serves as a protection against overstressing for the first contact spring tongues (13).



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Description

[0001] The invention relates to an electrical receptacle contact consisting of a contacting region for contacting a complementary contact blade and a connecting region for connection to an electrical conductor.

[0002] Electrical receptacle contacts are employed in plug connectors which are often used in systems with high vibrations, for example in the automotive industry.

[0003] FR 26 47 602-A1 discloses a one-part electrical receptacle contact consisting of a contacting region for contacting a complementary contact blade and a connecting region for connection to an electrical conductor. The contacting region is box-shaped with a top wall and a bottom wall. In the bottom wall, the contacting region comprises two parallel first contact spring tongues for contacting the complementary contact blade. The top wall includes at least one first stamping which is oriented to extend into the box-shaped contacting region opposite the first contact spring tongues and serves for contacting the contact blade.

[0004] The bottom wall of the contacting region is of double-walled construction and additionally includes, above the contact spring tongues, a wall which serves as a stop for the contact spring tongues. Owing to the special design of the bottom wall, the material consumption for the production of this contact is relatively high. Moreover, it is disadvantageous that the contact blade is not introduced symmetrically into the centre of the receptacle contact. Further, it is disadvantageous that the contact blade is not securely guided within the receptacle contact and, for example, slight rotary movements of the contact blade are possible.

[0005] DE 43 42 363-A1 discloses a latching pluggable connection which has a similar construction. Instead of a contact blade, in this case there is provided a cable end sleeve which is protected in the receptacle contact against rotation by two ears bent inward from the side walls. In this arrangement, it is likewise disadvantageous that no symmetrical guidance of the cable end sleeve in the receptacle contact is provided for.

[0006] It is the object of the invention to provide a receptacle contact for contacting a complementary contact blade which ensures optimal utilisation of the material from which the contact is formed and with which a reliable contacting of the mating contact blade can be established.

[0007] The object is achieved by a device having a contacting region for contacting a complementary contact blade and a connecting region for connection to an electrical conductor, the contacting region being of box-shaped design with a top wall and a bottom wall, and further the contacting region further including two parallel first contact spring tongues formed in the bottom wall, at least one first stamping in the top wall that is oriented into the box-shaped contact region for contacting the complementary contact blade and which lies opposite the first contact spring tongues, characterized in

that a web is provided in the bottom wall between the first contact spring tongues and running parallel to the first contact spring tongues, and in that the web includes a second stamping which is oriented into the box-shaped contacting region and serves as a protection against overstressing for the first contact spring tongues.

[0008] It is another object of the invention that a particularly good utilisation of material be achieved. This is achieved by the fact that the contacting region of the receptacle contact is constructed in such a way that it is not necessary to design walls or wall regions with double layers of material.

[0009] A further object is the reliable contacting of a contact blade. Reliable contacting is to be ensured even when used in highly vibrating systems. This is achieved by providing a protection against overstressing of the first contact spring tongues, which are formed in the bottom wall of the contacting region and contact the contact blade. The protection against overstressing is a web that is arranged between the first contact spring tongues and formed by a second stamping which is oriented into the box-shaped contacting region to serve as a stop for a mating contact blade.

[0010] It is further of particular advantage that a complementary contact blade is received symmetrically in the receptacle contact. This means that the distance of the contact blade from opposite outer walls of the contacting region is in each case the same. This is achieved as the receptacle contact has on the top side, a contacting surface for the contact blade and has on the bottom side, opposed first contact spring tongues. By means of which, a central location of the contact blade between the top wall and the bottom wall is achieved. The symmetrical arrangement achieves the effect that the receptacle contact can be inserted into a contact chamber even when rotated through 180°.

[0011] It is further of particular advantage that the electrical receptacle contact according to the invention can be latched in a housing. This is achieved by a latching spring tongue that is provided in the top wall and in the bottom wall. As the receptacle contact is inserted into a chamber of a housing, these latching spring tongues engage behind corresponding shoulders of the chamber and the receptacle contact is prevented from being pulled out.

[0012] It is further of particular advantage that rotation and looseness of the contact blade in the receptacle contact is avoided. This is particularly important in highly vibrating systems. This is achieved by a third stamping that is provided on both sides of the latching spring tongue in the top wall and in the bottom wall to serve for guiding the contact blade. This third stamping is offset with respect to the points of contact in the direction of insertion of the contact blade, thereby ensuring a particularly good protection against rotation of the contact blade in the receptacle contact.

[0013] It is further of particular advantage that guid-

ance of the contact blade, also in relation to the side walls, is provided for. This is achieved by a fourth stamping in the side walls, which serves for guidance and lateral contacting of the contact blade. Besides the fourth stampings, or instead of these fourth stampings, the side walls may also comprise second contact spring tongues, which serve for lateral contacting or guidance of the contact blade.

[0014] It is further of particular advantage that an additional lead-in funnel is not required at the insertion-face-side end of the contact. This is achieved by the first contact spring tongues each having a free end oriented towards the cable-side end of the contacting region.

[0015] It is further of particular advantage that the latching spring tongues are protected against catching and against the penetration of foreign bodies between the free end of the latching spring tongue and the box-shaped contacting region. This is achieved by two opposite ears oriented perpendicular to the direction of insertion that are provided in each case in the top wall and in the bottom wall. The ears are bent perpendicularly out of the top wall and the bottom wall and correspond in their height to the height of the free end of the latching spring tongues. The ears are arranged in the region of the free end of the latching spring tongues.

[0016] It is further of particular advantage that, besides the primary locking of the contact in a housing by means of the latching spring tongues, a secondary locking is also made possible. The secondary locking of the electrical contact is achieved by a corresponding secondary-locking element that is provided in a corresponding chamber that engages behind the ears, which at the same time can serve to protect the latching spring tongues.

[0017] It is further particularly advantageous that the contact can be produced in one part so that optimized material consumption can thereby be achieved.

[0018] The invention will now be explained with the aid of an exemplary embodiment, in which:

Figure 1 shows a plan view of a contact according to the invention which is partly cut open and in which the parts of the contact which cannot be seen are also marked in broken lines;

Figure 2 shows a cross-section through the contact according to Figure 1 along the line A-A;

Figure 3 shows a cross-section through the contact according to Figure 1 along the line B-B;

Figure 4 shows a cross-section through the contact according to Figure 1 along the line C-C;

Figure 5 shows a bottom-wall view of the contact according to the invention, of Figure 1, the parts which are not visible being marked in broken lines; Figure 6 shows a cross-section through the contact according to the invention along the line D-D as marked in Figure 1; and

Figure 7 shows the layout of the contact according to the invention with stampings provided.

[0019] A receptacle contact according to the invention is shown a one-part electrical receptacle contact 1 for receiving a complementary contact blade (not shown). The receptacle contact 1 is made from a metal sheet by punching, stamping and bending. It is designed for use in a plastic connector housing (not shown) with contact chambers and to be secured in this chamber in a latched manner.

[0020] The receptacle contact 1 comprises a contacting region 2 for contacting the complementary contact blade and a connecting region 3 for connection to an electrical conductor (not shown). The connecting region 3 is designed as a crimping region. It consists of a first crimping region 4 which is of U-shaped design in cross-section and a second crimping region 5 which is likewise of U-shaped design in cross-section, as illustrated in Figures 3 and 4. The second crimping region 5 serves for fastening the insulation of the electrical conductor to be contacted, while the first crimping region 4 serves for contacting the electrical conductor. The contacting region 2 may also be combined with differently designed connecting regions 3 which employ, for example, the insulation displacement contact method of termination.

[0021] The features of the electrical receptacle contact 1 according to the invention relate to the contacting region 2. The contacting region 2 is a box-shaped design having two side walls 6, 7, a top wall 8 and a bottom wall 9. The top wall 8 consists of two top-wall parts. In the top wall 8 there is a seam 10, at which the two top-wall parts butt against one another. The top-wall parts are connected to one another by means of welding spots 11. In the top wall 8, there is further provided a first stamping 12 oriented into the box-shaped contacting region 2. The first stamping 12 is divided into two parts by the seam 10. The first stamping 12 serves for contacting the contact blade. In the bottom wall 9, there are two first contact spring tongues 13 disposed parallel to one another. The contact spring tongues 13 are joined to the box-shaped contacting region 2 at the front-face-side end and comprise ends 14 which are free towards the conductor-side end of the contacting region. Between the first contact spring tongues 13 there is a web 15. The web 15 is produced by a second stamping 16 which is oriented into the box-shaped contacting region 2 and is designed as a protection against overstressing for the first contact spring tongues 13.

[0022] The contacting of an electrical blade contact thus takes place via the first stamping 12 and via the contact spring tongues 13. It is thus possible to design the contact spring tongues 13 either in the form of ears with parallel side edges, as illustrated in Figure 5, or in the form of ears with side edges inclined with respect to one another, as exhibited by the first contact spring tongues 13' in Figure 7.

[0023] Besides the above-specified means for contacting, the contacting region 2 comprises a second contact spring tongue 17 in each of the side walls 6, 7.

The contact spring tongues 17 are likewise oriented with their free ends towards the cable-side end 3 of the contact. Besides these second contact spring tongues 17, or instead of these second contact spring tongues 17, fourth stampings 18 may be provided in the side walls 6, 7 which likewise serve for contacting the complementary contact blade. It is also possible, however, for the fourth stampings 18 and/or the second contact spring tongues 17 to serve not only for contacting the contact blade but also for aligning the contact blade between the side walls 6, 7 of the receptacle contact 1.

[0024] It is customary to insert electrical receptacle contacts into corresponding chambers of a connector housing. To this end, it is necessary to secure the receptacle contacts in the chambers. A distinction is made between a so-called first and a second contact securing. The receptacle contact 1 according to the invention comprises a latching spring tongue 19 on the top and bottom wall 8, 9, for retaining the receptacle contact 1 in a chamber of a connector housing. The so-called first contact securing is thereby performed. Further, the receptacle contact 1 comprises two opposing ears 20 oriented perpendicular to the direction of contact insertion in the top wall 8 and in the bottom wall 9. The ears 20 are bent substantially perpendicularly out of the top and bottom wall 8, 9. They serve to protect the latching spring tongues 19 in order, for example, to prevent a cable, for example, from being able to engage under the free end of the latching spring tongues 19. The ears 20 can at the same time cooperate with a secondary locking mechanism of a housing for receiving the receptacle contact. For example, this could be a slide that engages behind the ears 20 in one position and removal of the receptacle contact is only possible if the slide is put into a second position.

[0025] Beside the latching spring tongues 19 in the top wall 8 and bottom wall 9, there is a third stamping 21. The third stamping 21 is arranged in the top and bottom wall 8, 9. This third stamping 21 achieves the effect that a contact blade to be inserted into the receptacle contact 1 is precisely guided, thereby ensuring a rotary movement of the contact blade is not possible.

[0026] The box-shaped contacting region 2 has a particularly high structural stability by a circumferential completely closed band 24 which in each case, at its front-side end 22 and at its cable-side end 23, is joined to the connecting region 3. The band 24 being closed by a welding spot 11.

[0027] To summarize, the advantages of the above-described receptacle contact will be mentioned once again. It is of particular advantage that particularly good utilisation of material is achieved. It is advantageous that reliable electrical engagement of a contact blade is obtained. It is further of particular advantage that a complementary contact blade is received symmetrically in the receptacle contact. It is further of particular advantage that the one-part electrical receptacle contact according to the invention can be latched in a housing.

It is further of particular advantage that rotation and looseness of the contact blade in the receptacle contact is avoided. It is further of particular advantage that a guidance of the contact blade in relation to the side walls is provided for. It is further of particular advantage that an additional lead-in funnel is not required at the insertion-face-side end of the contact. It is further of particular advantage that the latching spring tongues are protected against catching and against the penetration of foreign bodies between the free end of the latching spring tongue and the box-shaped contacting region. It is further of particular advantage that, besides the primary locking of the contact in a housing by means of the latching spring tongues, a secondary locking is also possible.

Claims

1. An electrical receptacle contact (1) comprising a contacting region (2) for contacting a complementary contact blade and a connecting region (3) for connection to an electrical conductor, the contacting region (2) being of box-shaped design with a top wall (8) and a bottom wall (9), and further the contacting region (2) further including two parallel first contact spring tongues (13) formed in the bottom wall (9), at least one first stamping (12) in the top wall that is oriented into the box-shaped contact region (2) for contacting the complementary contact blade and which lies opposite the first contact spring tongues (13), characterized in that a web (15) is provided in the bottom wall (9) between the first contact spring tongues (13) and running parallel to the first contact spring tongues (13), and in that the web (15) includes a second stamping (16) which is oriented into the box-shaped contacting region (2) and serves as a protection against over-stressing for the first contact spring tongues (13).
2. Electrical receptacle contact according to Claim 1, characterized in that a latching spring tongue (19) is provided in each case in the top wall (8) and the bottom wall (9).
3. Electrical receptacle contact according to Claim 2, characterized in that a third stamping (21) is provided in each case in the top wall (8) and the bottom wall (9) on both sides of the latching spring tongue (19), for guiding the contact blade.
4. Electrical receptacle contact according to one of Claims 2 or 3, characterized in that two opposite ears (20) oriented perpendicular to the direction of insertion are provided in each case in the top wall (8) and in the bottom wall (9), which ears are bent substantially perpendicularly out of the top wall (8) and the bottom wall (9) to protect the latching spring tongues (19).

5. Electrical receptacle contact according to Claim 4, characterized in that the ears (20) are arranged in the region of the free end of the latching spring tongues (19). 5
6. Electrical receptacle contact according to one of Claims 4 or 5, characterized in that the ears (20) cooperate with a secondary locking mechanism of a housing for receiving the contact. 10
7. Electrical receptacle contact according to one of Claims 1 to 6, characterized in that the contacting region (2) comprises two side walls (6, 7) and in that the side walls (6, 7) comprise two contact spring tongues (17) for lateral contacting of the contact blade. 15
8. Electrical receptacle contact according to one of Claims 1 to 7, characterized in that the contacting region (2) comprises two side walls (6, 7) and in that the side walls (6, 7) comprise fourth stampings (18) for lateral contacting of the contact blade. 20
9. Electrical receptacle contact according to one of Claims 1 to 8, characterized in that the contacting region (2) comprises an insertion-face-side end and a cable-side end connected to the connecting region and in that the first contact spring tongues (13) each comprise a free end (14) oriented towards the cable-side end. 25 30
10. Electrical receptacle contact according to one of Claims 1 to 9, characterized in that the box-shaped contacting region (2) comprises a seam (10) in the top wall (8). 35
11. Electrical receptacle contact according to one of Claims 1 to 10, characterized in that the box-shaped contacting region (2) is closed by at least one welding spot (11). 40

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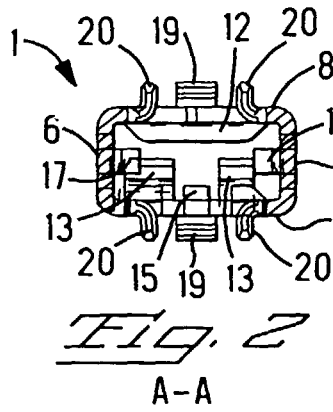


Fig. 2

A-A

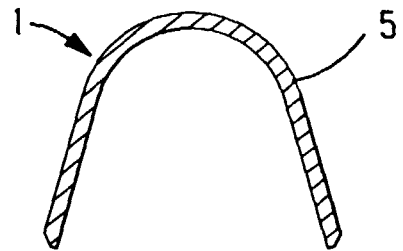


Fig. 4

C-C

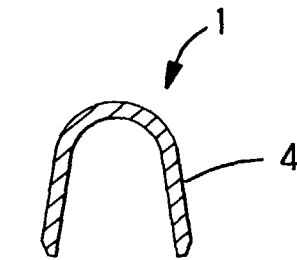
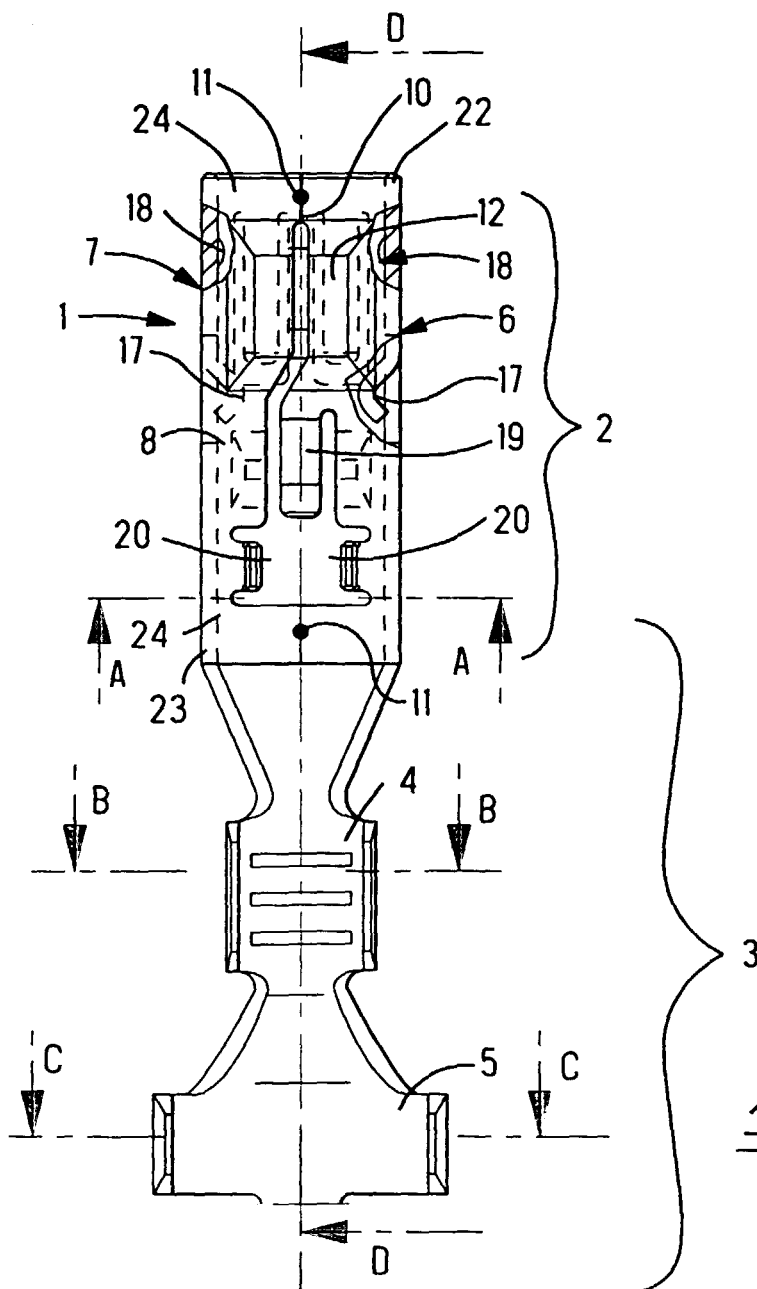


Fig. 3

B-B

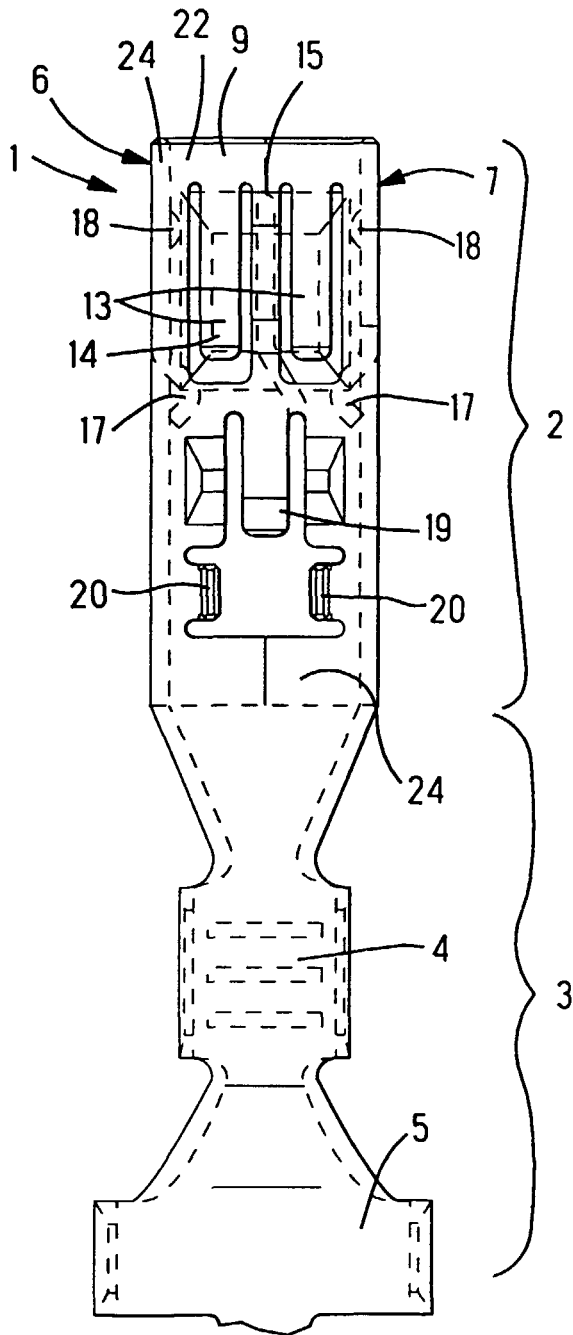


Fig. 5

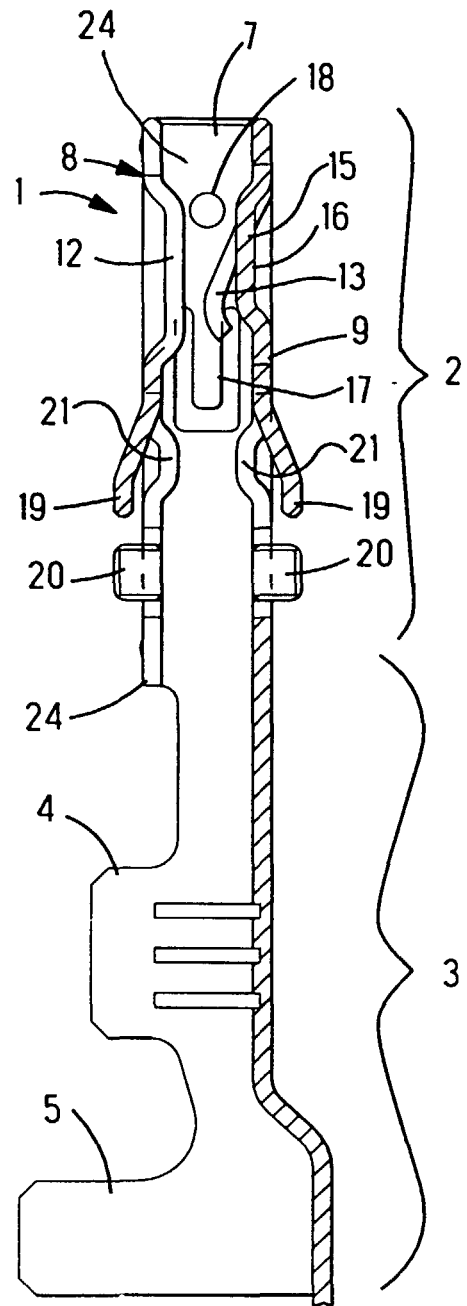


Fig. 6

D-D

